Department of Electronic & Telecommunication Engineering

University of Moratuwa

Project Report

Team Leptons

MeasureUP- Anthropometric Height Measuring Device

Submitted by:

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1. Introduction

In healthcare, sports, and research, precise human height measurement holds tremendous importance. This is especially true in pediatric care, where deviations from expected growth patterns can raise concerns about a child's health. Our project aims to revolutionize the way height measurements are conducted within clinical settings. We present an innovative digital solution that maintains the precision and efficiency of traditional height-measuring devices while introducing portability. Crucially, our system automates the entire clinic workflow, from height measurement to seamless record delivery to attending physicians. This not only reduces the reliance on manual measurements by healthcare personnel but also enhances data accuracy and resource efficiency, promising improved patient care and clinical outcomes.

1.1 Problem Description

Traditional methods of measuring height, such as using a measuring tape or stadiometer, require the assistance of a second person, which can be time-consuming and inconvenient. These methods have limitations that can lead to inaccurate measurements and inconvenience for both the person being measured and the person performing the measurement. Additionally, some individuals may experience discomfort or self-consciousness when being measured by another individual, which can lead to inaccurate measurements

Furthermore, clinics require a dependable and precise method for measuring patient height. This is essential for a number of reasons, including monitoring the growth of children, tracking changes in adult height, and calculating the body mass index (BMI). Traditional height measurement methods, such as stadiometers, are typically immobile and require additional personnel to assist with the measurement process. Not only does this increase the labour costs associated with height measurement, but it also makes the process more cumbersome for both the clinic staff and the patients.

There is a need for a portable and independent height measuring device that can provide accurate and reliable height measurements in clinical settings in order to address these issues. This device would reduce the labour costs associated with height measurement, eliminate the need for additional personnel to assist with the measurement process, and allow patients to independently measure their height, thereby reducing the burden on clinic staff.

2. The device

Our portable electronic height measuring device is designed to simplify and improve the process of measuring a patient's height in clinical settings device eliminating the need for additional personnel, enabling healthcare providers to allocate their resources more effectively. . This device consists of two main parts

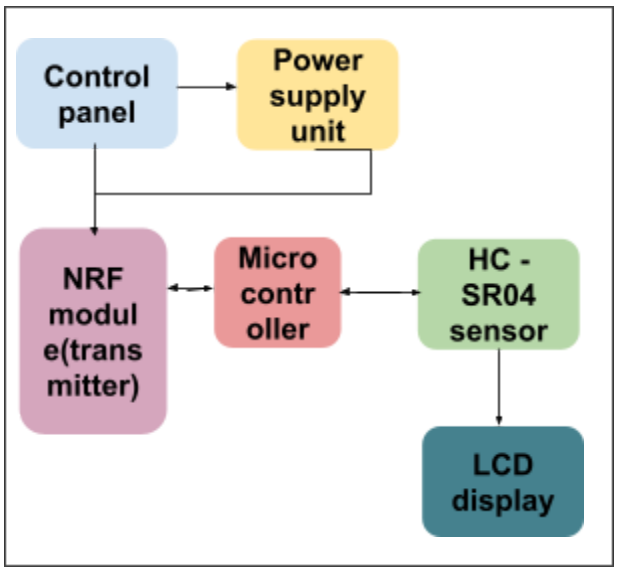
2.1 Height Measuring Device

This essential component of our device is securely attached to the wall within the clinical environment. Patients can comfortably position themselves underneath it to obtain a precise height measurement. The device is designed for durability and user-friendliness, ensuring consistent and trustworthy measurements.

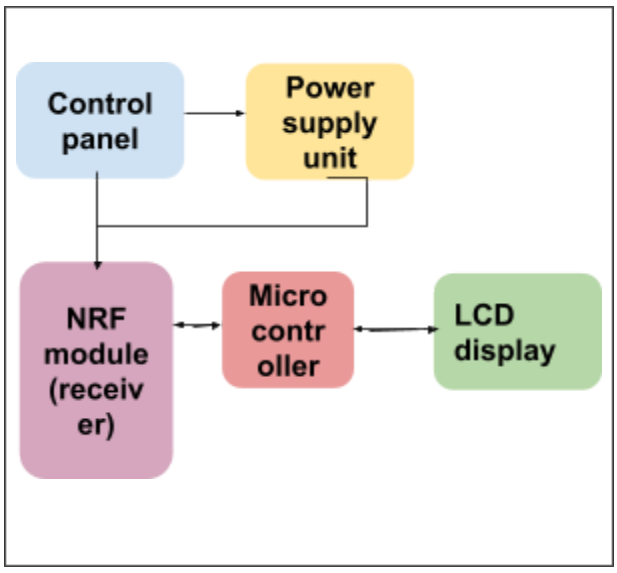
2.2 Wireless Display

The wireless display unit is the second part of our device. It communicates wirelessly with the wall-mounted height measuring device. It shows the patient's height in real-time to healthcare professionals. This wireless feature makes the device convenient and eliminates the need for manual data entry. Healthcare providers can access height measurements instantly, improving their work process and reducing the chance of mistakes. This will display the data to the medical officer right at their workstation, ensuring immediate access to patient information without the need to leave their designated area.

2.3 Product Architecture



Height Measuring Device



Wireless Display

3. Future Improvements

As part of our future improvement plans, we are developing a weight measuring device that seamlessly integrates with our existing technology. This device will enable us to collect weight data and transmit it wirelessly to our display unit, where it will be presented alongside real-time Body Mass Index (BMI) calculations.

Our plan includes the incorporation of highly precise sensors for height measurement, ensuring even greater accuracy in capturing patient height data. Additionally, we are adopting more efficient and accurate wireless communication modules, enhancing the speed and reliability of data transmission between our device components.

3.1 Bill of Quantities (With future improvements)

Height Measuring Device	**Weight Measuring Device**	**Wireless display**
AtMega - Rs.1,400	AtMega - Rs.1,400	AMega - Rs.1,400
NRF module - Rs. 320	NRF module - Rs.320	NRF module- Rs.320
PCB - Rs.480	PCB - Rs.480	PCB- Rs. 480
Ultrasonic sensor - Rs. 300	Weight Sensors x4- Rs.1,600	Oled display - Rs. 900
Oled display - Rs.900	Oled display - Rs.900	Enclosure - Rs.3,000
Enclosure - Rs.3,000	Enclosure - Rs.5000	
Total - Rs.6,400	Total - Rs.9,700	Total- Rs.6,100

For one unit including all 3 devices = Rs. 22,200.00
For a limited production of 10 such units = Rs.222,000.00

4. Marketing

We are developing a lineup of three specialized healthcare devices to cater to diverse needs in the healthcare industry. These three innovative products are tailored to meet varying healthcare requirements, making it easier to address specific customer needs and preferences.

- Integrated Height Measuring Device: Simplifies height measurement, displaying accurate results instantly on the same unit.

- Wireless Display Height Measurement Device: Provides precise height measurements with wireless data transmission to a separate display unit.
- Height and Weight Measurement Device with Wireless Display: Offers high-precision measurements for both height and weight with wireless data transmission.

Within our product lineup, the **Integrated Height Measurement Device** caters primarily to the domestic market, where its simplicity and ease of use find ample opportunities. In households, it can serve individuals keen on monitoring their own height or that of family members, particularly in situations where a wireless display is unnecessary. This device capitalizes on the growing trend of health consciousness, enabling users to conveniently track anthropometric measurements in the comfort of their homes.

Conversely, the **Wireless Display Height Measurement Device** and the **Height and Weight Measurement Device with Wireless Display** are poised for success within healthcare and wellness settings. These devices, designed for clinics, hospitals, and fitness centers, align with the increasing demand for efficient and accurate healthcare technology. They not only streamline the measurement process but also enhance the overall patient and client experience. By eliminating manual data entry and offering wireless data transmission, they empower healthcare providers and fitness professionals to optimize their services, all while maintaining precision and reliability.

In essence, our product lineup seizes marketing opportunities in both personal and professional spheres, capitalizing on the rising interest in health monitoring and the need for efficient healthcare solutions. Each device is uniquely poised to thrive in its respective market, ensuring broad marketability and widespread adoption.

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